

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Very Shallow

Site ID: R060AY016SD

Major Land Resource Area: 60A – Pierre Shale Plains

Physiographic Features

This site typically occurs on gently to steeply sloping uplands.

Landform: terrace, knoll, ridge

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	2500	4300
Slope (percent):	6	50
Water Table Depth (inches):	None	None
Flooding:		
Frequency:	None	None
Duration:	None	None
Ponding:		
Depth (inches):	None	None
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	Medium



Climatic Features

The climate in this MLRA is typical of the drier portions of the Northern Great Plains where sagebrush steppes to the west yield to grassland steppes to the east. Annual precipitation ranges from 13 to 18 inches per year, with most occurring during the growing season. Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air masses from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring. The normal average annual temperature is about 46° F. January is the coldest month with average temperatures ranging from about 19° F (Moorcroft CAA, WY) to about 22° F (Belle Fourche, SD). July is the warmest month with temperatures averaging from about 70° F (Moorcroft CAA, WY) to about 72° F (Belle Fourche, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 51° F. Hourly winds are estimated to average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

RANGELAND INTERPRETATIONS

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Growth of cool season plants begins in early to mid March, slowing or ceasing in late June. Warm season plants begin growth about mid May and can continue to early or mid September. Green up of cool season plants may occur in September and October when adequate soil moisture is present.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	122	129
Freeze-free period (days):	145	152
Mean Annual Precipitation (inches):	13	18

Average Monthly Precipitation (inches) and Temperature (°F):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.32	0.43	7.1	34.1
February	0.44	0.57	12.6	40.1
March	0.65	0.94	19.7	46.5
April	1.43	1.72	29.4	60.2
May	2.45	3.19	39.7	70.6
June	2.34	3.38	48.5	80.1
July	1.60	2.78	54.8	88.0
August	1.24	1.76	53.1	87.7
September	1.01	1.50	42.3	77.0
October	0.90	1.11	31.4	64.9
November	0.40	0.61	19.8	47.5
December	0.40	0.48	10.2	38.0

Climate Stations		Period	
Station ID	Location or Name	From	To
SD0236	Ardmore 2 N	1948	1999
SD0559	Belle Fourche	1948	1999
SD1124	Buffalo Gap	1951	1999
WY6395	Moorcroft CAA	1948	1998
WY9207	Upton 13 SW	1949	1998

For other climate stations that may be more representative, refer to <http://www.wcc.nrcs.usda.gov>.

Influencing Water Features

No significant water features influence this site.

Representative Soil Features

The soils in this site are well drained and formed in soft siltstone, sandstone, porcelanite or alluvium. The loam surface layer is 3 to 6 inches thick. The soils have a moderate infiltration rate. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are restrictive to water movement and root penetration.

These soils are mainly susceptible to water erosion. The hazard of water erosion increases on slopes greater than about 15 percent. Low available water capacity caused by the shallow rooting depth strongly influences the soil-water-plant relationship.

More information can be found in the various soil survey reports. Contact the local USDA Service Center for soil survey reports that include more detail specific to your location.

Parent Material Kind: alluvium, outwash
Parent Material Origin: sedimentary, unspecified
Surface Texture: loam
Surface Texture Modifier: gravelly, very gravelly
Subsurface Texture Group: loamy
Surface Fragments $\leq 3''$ (% Cover): 0-25
Surface Fragments $> 3''$ (%Cover): 0-10
Subsurface Fragments $\leq 3''$ (% Volume): 20-70
Subsurface Fragments $> 3''$ (% Volume): 6-65

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	excessively
Permeability Class:	moderately rapid	rapid
Depth (inches):	0	10
Electrical Conductivity (mmhos/cm)*:	0	4
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	6.1	8.4
Soil Reaction (0.1M CaCl₂)*:	NA	NA
Available Water Capacity (inches)*:	1	3
Calcium Carbonate Equivalent (percent)*:	0	10

* - These attributes represent from 0-40 inches or to the first restrictive layer.

Plant Communities

Ecological Dynamics of the Site:

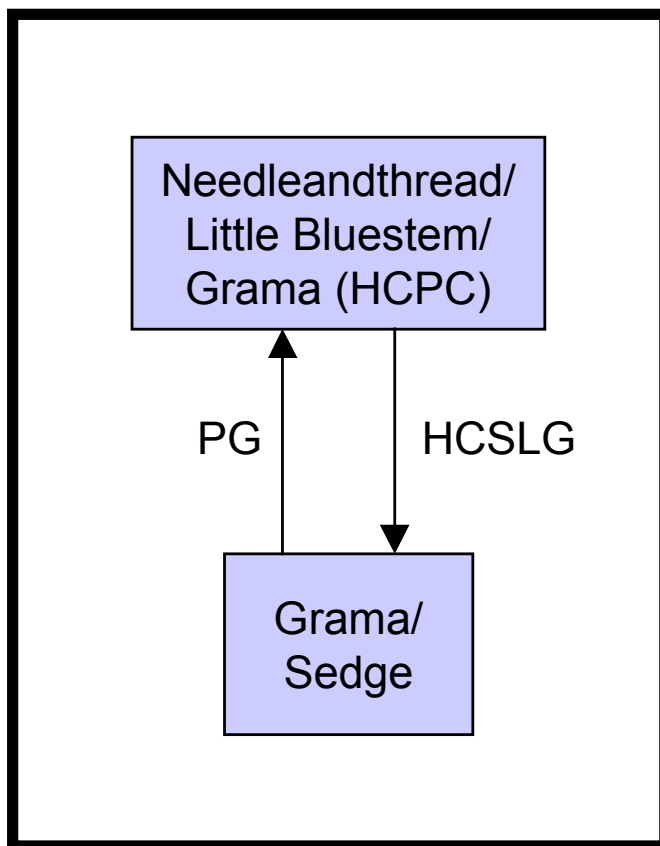
This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

Continuous grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the HCPC. Species such as threadleaf sedge and blue grama will initially increase. Plains muhly, western wheatgrass, bluebunch wheatgrass, little bluestem and sideoats grama will decrease in frequency and production and later disappear. Heavy continuous grazing causes blue grama and/or threadleaf sedge to dominate.

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). The HCPC has been determined by studying rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following diagram illustrates the common plant communities and vegetation states commonly occurring on the site and the transition pathways between communities and states. The ecological processes are discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



HCPC - Historic Climax Plant Community;
HCSLG - Heavy, continuous season-long grazing;
PG - Prescribed grazing.

Plant Community Composition and Group Annual Production

			Needleandthread/Little Bluestem/Grama (HCPC)		
COMMON/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Group	lbs./acre	% Comp
GRASSES & GRASS-LIKES				600 - 720	75 - 90
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	80 - 160	10 - 20
MID WARM SEASON GRASSES			2	80 - 160	10 - 20
little bluestem	Schizachyrium scoparium	SCSC	2	80 - 120	10 - 15
plains muhly	Muhlenbergia cuspidata	MUCU3	2	16 - 40	2 - 5
GRAMA			3	160 - 320	20 - 40
sideoats grama	Bouteloua curtipendula	BOCU	3	80 - 200	10 - 25
blue grama	Bouteloua gracilis	BOGR2	3	40 - 160	5 - 20
hairy grama	Bouteloua hirsuta	BOHI2	3	40 - 80	5 - 10
WHEATGRASS			4	40 - 80	5 - 10
western wheatgrass	Pascopyrum smithii	PASM	4	40 - 80	5 - 10
thickspike wheatgrass	Elymus lanceolatus ssp. lanceolatus	ELLAL	4	0 - 40	0 - 5
OTHER NATIVE GRASSES			5	8 - 40	1 - 5
sand dropseed	Sporobolus cryptandrus	SPCR	5	0 - 16	0 - 2
prairie junegrass	Koeleria macrantha	KOMA	5	8 - 40	1 - 5
Sandberg bluegrass	Poa secunda	POSE	5	8 - 16	1 - 2
bluebunch wheatgrass	Pseudoroegneria spicata	PSSP6	5	0 - 40	0 - 5
threeawn	Aristida spp.	ARIST	5	0 - 8	0 - 1
prairie sandreed	Calamovilfa longifolia	CALO	5	0 - 40	0 - 5
other perennial grasses		2GP	5	0 - 40	0 - 5
GRASS-LIKES			6	40 - 120	5 - 15
threadleaf sedge	Carex filifolia	CAFI	6	40 - 120	5 - 15
sedge	Carex spp.	CAREX	6	0 - 16	0 - 2
FORBS			8	40 - 120	5 - 15
American pasqueflower	Pulsatilla patens	PUPA5	8	0 - 16	0 - 2
cudweed sagewort	Artemisia ludoviciana	ARLU	8	8 - 24	1 - 3
cutleaf ironplant	Machaeranthera pinnatifida	MAPI	8	0 - 16	0 - 2
dotted gayfeather	Liatris punctata	LIPU	8	8 - 40	1 - 5
erigonum	Eriogonum spp.	ERIOG	8	0 - 8	0 - 1
green sagewort	Artemisia dracunculus	ARDR4	8	0 - 16	0 - 2
hairy goldaster	Heterotheca villosa	HEVI4	8	8 - 32	1 - 4
heath aster	Symphyotrichum ericoides	SYER	8	8 - 24	1 - 3
Hood's phlox	Phlox hoodii	PHHO	8	8 - 16	1 - 2
Indian breadroot	Pedimelum esculentum	PEES	8	0 - 16	0 - 2
milkvetch	Astragalus spp.	ASTRA	8	0 - 8	0 - 1
prairie coneflower	Ratibida columnifera	RACO3	8	8 - 24	1 - 3
purple coneflower	Echinacea angustifolia	ECAN2	8	8 - 24	1 - 3
purple prairie clover	Dalea purpurea	DAPU5	8	8 - 24	1 - 3
pussytoes	Antennaria spp.	ANTEN	8	8 - 16	1 - 2
rush skeletonweed	Lygodesmia juncea	LYJU	8	0 - 16	0 - 2
scarlet gaura	Gaura coccinea	GACO5	8	0 - 16	0 - 2
scarlet globemallow	Sphaeralcea coccinea	SPCO	8	0 - 16	0 - 2
stemless hymenoxys	Tetranneuris acaulis	TEAC	8	0 - 16	0 - 2
white prairie clover	Dalea candida	DACA7	8	8 - 24	1 - 3
wild onion	Allium spp.	ALLIU	8	0 - 8	0 - 1
other perennial forbs		2FP	8	0 - 24	0 - 3
SHRUBS			9	40 - 80	5 - 10
broom snakeweed	Gutierrezia sarothrae	GUSA2	9	0 - 8	0 - 1
cactus	Opuntia spp.	OPUNT	9	0 - 16	0 - 2
fringed sagewort	Artemisia frigida	ARFR4	9	8 - 24	1 - 3
rose	Rosa spp.	ROSA5	9	8 - 24	1 - 3
skunkbush sumac	Rhus trilobata	RHTR	9	0 - 24	0 - 3
yucca	Yucca glauca	YUGL	9	0 - 24	0 - 3
other shrubs		2SHRUB	9	0 - 24	0 - 3

	Annual Production lbs./acre	LOW	RV	HIGH
	GRASSES & GRASS-LIKES	380 -	660	- 890
	FORBS	35 -	80	- 125
	SHRUBS	35 -	60	- 85
	TOTAL	450 -	800	- 1100

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community Composition and Group Annual Production

		Needleandthread/Little Bluestem/Grama (HCPC)			Grama/Sedge				
COMMON/GROUP NAME	SYMBOL	Group	lbs./acre	% Comp	Group	lbs./acre	% Comp		
GRASSES & GRASS-LIKES			600 - 720	75 - 90		260 - 340	65 - 85		
needleandthread	HECOC8	1	80 - 160	10 - 20	1	4 - 20	1 - 5		
MID WARM-SEASON GRASSES		2	80 - 160	10 - 20	2	8 - 20	2 - 5		
little bluestem	SCSC	2	80 - 120	10 - 15	2	4 - 20	1 - 5		
plains muhly	MUCU3	2	16 - 40	2 - 5	2	4 - 20	1 - 5		
GRAMA		3	160 - 320	20 - 40	3	120 - 180	30 - 45		
sideoats grama	BOCU	3	80 - 200	10 - 25	3	0 - 20	0 - 5		
blue grama	BOGR2	3	40 - 160	5 - 20	3	80 - 140	20 - 35		
hairy grama	BOHI2	3	40 - 80	5 - 10	3	40 - 80	10 - 20		
WHEATGRASS		4	40 - 80	5 - 10	4	4 - 20	1 - 5		
western wheatgrass	PASM	4	40 - 80	5 - 10	4	4 - 20	1 - 5		
thickspike wheatgrass	ELLAL	4	0 - 40	0 - 5	4	0 - 4	0 - 1		
OTHER NATIVE GRASSES		5	8 - 40	1 - 5	5	4 - 20	1 - 5		
sand dropseed	SPCR	5	0 - 16	0 - 2	5	0 - 8	0 - 2		
prairie junegrass	KOMA	5	8 - 40	1 - 5	5	4 - 20	1 - 5		
Sandberg bluegrass	POSE	5	8 - 16	1 - 2	5	4 - 12	1 - 3		
bluebunch wheatgrass	PSSP6	5	0 - 40	0 - 5					
threeawn	ARIST	5	0 - 8	0 - 1	5	4 - 20	1 - 5		
prairie sandreed	CALO	5	0 - 40	0 - 5	5	0 - 8	0 - 2		
other perennial grasses	2GP	5	0 - 40	0 - 5	5	0 - 12	0 - 3		
GRASS-LIKES		6	40 - 120	5 - 15	6	80 - 140	20 - 35		
threadleaf sedge	CAFI	6	40 - 120	5 - 15	6	80 - 140	20 - 35		
sedge	CAREX	6	0 - 16	0 - 2	6	4 - 20	1 - 5		
NON-NATIVE GRASSES		7			7	4 - 8	1 - 2		
cheatgrass	BRTE				7	4 - 8	1 - 2		
FORBS		8	40 - 120	5 - 15	8	40 - 80	10 - 20		
American pasqueflower	PUPA5	8	0 - 16	0 - 2	8	0 - 4	0 - 1		
cudweed sagewort	ARLU	8	8 - 24	1 - 3	8	4 - 12	1 - 3		
curlycup gumweed	GRSQ				8	0 - 12	0 - 3		
cutleaf ironplant	MAPI	8	0 - 16	0 - 2	8	4 - 12	1 - 3		
dotted gayfeather	LIPU	8	8 - 40	1 - 5	8	4 - 20	1 - 5		
eriogonum	ERIOG	8	0 - 8	0 - 1	8	0 - 12	0 - 3		
green sagewort	ARDR4	8	0 - 16	0 - 2	8	4 - 12	1 - 3		
hairy goldaster	HEVI4	8	8 - 32	1 - 4	8	4 - 20	1 - 5		
heath aster	SYER	8	8 - 24	1 - 3	8	4 - 20	1 - 5		
Hood's phlox	PHHO	8	8 - 16	1 - 2	8	8 - 20	2 - 5		
Indian breadroot	PEES	8	0 - 16	0 - 2	8	0 - 8	0 - 2		
milkvetch	ASTRA	8	0 - 8	0 - 1	8	4 - 12	1 - 3		
prairie coneflower	RACO3	8	8 - 24	1 - 3	8	4 - 20	1 - 5		
purple coneflower	ECAN2	8	8 - 24	1 - 3	8	4 - 12	1 - 3		
purple prairie clover	DAPU5	8	8 - 24	1 - 3	8	0 - 8	0 - 2		
pussytoes	ANTEN	8	8 - 16	1 - 2	8	4 - 20	1 - 5		
rush skeletonweed	LYJU	8	0 - 16	0 - 2	8	0 - 16	0 - 4		
scarlet gaura	GACO5	8	0 - 16	0 - 2	8	0 - 8	0 - 2		
scarlet globemallow	SPCO	8	0 - 16	0 - 2	8	0 - 8	0 - 2		
stemless hymenoxys	TEAC	8	0 - 16	0 - 2	8	0 - 8	0 - 2		
white prairie clover	DACA7	8	8 - 24	1 - 3	8	0 - 8	0 - 2		
wild onion	ALLIU	8	0 - 8	0 - 1	8	0 - 12	0 - 3		
other perennial forbs	2FP	8	0 - 24	0 - 3	8	4 - 20	1 - 5		
SHRUBS		9	40 - 80	5 - 10	9	20 - 60	5 - 15		
broom snakeweed	GUSA2	9	0 - 8	0 - 1	9	4 - 20	1 - 5		
cactus	OPUNT	9	0 - 16	0 - 2	9	0 - 20	0 - 5		
fringed sagewort	ARFR4	9	8 - 24	1 - 3	9	8 - 24	2 - 6		
rose	ROSA5	9	8 - 24	1 - 3	9	4 - 12	1 - 3		
skunkbush sumac	RHTR	9	0 - 24	0 - 3	9	0 - 12	0 - 3		
yucca	YUGL	9	0 - 24	0 - 3	9	0 - 20	0 - 5		
other shrubs	2SHRUB	9	0 - 24	0 - 3	9	0 - 12	0 - 3		
Annual Production lbs./acre			LOW	RV		LOW	RV	HIGH	
GRASSES & GRASS-LIKES			380	660	- 890		150	300	- 450
FORBS			35	80	- 125		35	60	- 85
SHRUBS			35	60	- 85		15	40	- 65
TOTAL			450	800	- 1100		200	400	- 600

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value.

Plant Community and Vegetation State Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more information is collected, some of these plant community descriptions may be revised or removed, and new ones added. None of these plant communities should necessarily be thought of as “Desired Plant Communities”. According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC's) will be determined by the decision makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Needleandthread/Little Bluestem/Grama Plant Community

The plant community upon which interpretations are primarily based is the Needleandthread/Little Bluestem/Grama Plant Community. This is also considered to be the Historic Climax Plant Community (HCPC). This plant community can be found on areas that are properly managed with prescribed grazing that allows for proper utilization, changes in season of use and adequate recovery periods following each grazing event.

The potential vegetation is about 75-90% grasses or grass-like plants, 5-15% forbs and 5-10% shrubs. An even mix of both warm and cool-season grasses or grass-likes dominates this plant community. The major grasses or grass-likes include needleandthread, western wheatgrass, threadleaf sedge, little bluestem and both sideoats and blue grama. Other grasses occurring on the site include thickspike wheatgrass, bluebunch wheatgrass, plains muhly and prairie junegrass. The significant forbs include gayfeather, purple coneflower, prairie clover and cutleaf ironplant. Significant shrubs are fringed sagewort, rose, skunkbush sumac and yucca.

This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle and energy flow are functioning at the sites potential. Plant litter is properly distributed with some movement off-site and natural plant mortality is low. The diversity in plant species allows for high drought tolerance.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: SD6003

Growth curve name: Pierre Shale Plains, cool-season/warm-season co-dominant.

Growth curve description: Cool-season, warm-season co-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	20	28	21	10	5	3	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Heavy, continuous season long grazing will convert the plant community to the *Grama/Sedge Plant Community*.

Grama/Sedge Plant Community

This plant community can develop from the adverse effects of heavy, continuous season-long grazing. Short grasses and forbs increase to dominate the site and annual production decreases dramatically. Lack of litter and short plant heights result in higher soil temperatures, poor water infiltration rates, and higher evaporation, which gives blue grama and sedges a competitive advantage over cool and warm-season mid-grasses. Blue grama and threadleaf sedge are the dominant grass/grass-like species. Other grasses may include western wheatgrass, needleandthread, little bluestem, prairie junegrass and threeawn. Significant forbs include green sagewort, cutleaf ironplant, rush skeletonweed, hairy goldaster, pussytoes, Hood's phlox and scarlet globemallow. The significant shrubs include broom snakeweed, cactus and fringed sagewort.

This plant community is relatively stable. The competitive advantage of blue grama and threadleaf sedge prevents other species from establishing. This plant community is less productive than the HCPC. Runoff has increases and infiltration has decreased. Soil erosion does not increase appreciably.

The following growth curve is an estimate of the monthly percentages of total annual growth of the dominant species expected during a normal year:

Growth curve number: SD6003

Growth curve name: Pierre Shale Plains, cool-season/warm-season co-dominant.

Growth curve description: Cool-season, warm-season co-dominant.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	3	10	20	28	21	10	5	3	0	0

Transitional pathways and/or community pathways leading to other plant communities are as follows:

- Prescribed grazing will shift this plant community back to the *Needleandthread/Little Bluestem/Grama Plant Community*.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

-- Under Development --

Needleandthread/Little Bluestem/Grama Plant Community:

Grama/Sedge Plant Community:

Animal Preferences (Quarterly – 1,2,3,4[†])

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses & Grass-like							
blue grama	U D P D	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
bluebunch wheatgrass	U P D D	P P P P	U P D D	D D D D	D D D D	U P D D	U P D D
hairy grama	U D P D	D P P D	U D P U	D P P D	D P P D	U D P U	U D P U
little bluestem	U D D U	U U D U	U D D U	N D N N	N D N N	U D D U	U D D U
needleandthread	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
plains muhly	U U D U	U U D U	U U D U	N N N N	N N N N	U U D U	U U D U
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
prairie sandreed	U D D U	U D U U	U D D U	U U D U	U U D U	U D D U	U D D U
sand dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
Sandberg bluegrass	U U U U	U D U U	N U N N	N D N N	N D N N	N U N N	N U N N
sedge	U P U D	U P U D	U D U D	U D U D	U D U D	U D U D	U D U D
sideoats grama	U D P D	U P D D	U D P U	U P D U	U P D U	U D P U	U D P U
thickspike wheatgrass	U D D U	U D U U	U D D U	N D N N	N D N N	U D D U	U D D U
threadleaf sedge	U P U D	U P U D	U D U D	U D U D	U D U D	U D U D	U D U D
threeawn	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
western wheatgrass	U P D D	U D U U	U P D U	N D N N	N D N N	U P D U	U P D U
Forbs							
American pasqueflower	N N N N	N U N N	N N N N	N U N N	N U N N	N N N N	N N N N
cudweed sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U D U
cutleaf ironplant	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
dotted gayfeather	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
erigonum	U U D U	U U U U	U U D U	U U U U	U U U U	U U D U	U U U U
green sagewort	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
hairy goldaster	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	N N N N
heath aster	U U D U	U U P U	U U D U	U U P U	U U P U	U U D U	U U P U
Hood's phlox	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
Indian breadroot	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U D U U
milkvetch	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U D U U
prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U P P U
purple prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
pussytoes	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U	U U U U
rush skeletonweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	N N N N
scarlet gaura	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
scarlet globemallow	U U D U	U D D U	U U D U	U D D U	U D D U	U U D U	U D D U
stemless hymenoxys	U U U U	N U U N	U U U U	N U U N	N U U N	U U U U	N U U N
white prairie clover	U D P U	U P P U	U D P U	U P P U	U P P U	U D P U	U P P U
wild onion	U D U U	U D D U	U D U U	U D D U	U D D U	U D U U	U D D U
Shrubs							
broom snakeweed	N N N N	U U U U	N N N N	U U U U	U U U U	N N N N	U U U U
cactus	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
fringed sagewort	U U U U	U U U U	U U U U	U D D U	U P P D	U U U U	U U U D
rose	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U	U D D U
skunkbush sumac	D U U D	D D D D	D U U D	D U U D	D U U D	D U U D	D U U D
yucca	D N N D	D U U D	D N N D	D U U D	D U U D	D N N D	D U U D

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic

[†] Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists annual, suggested initial stocking rates with average growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of conservation planning. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this a resource inventory is necessary to document plant composition and production. More accurate carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data and actual stocking records, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Needleandthread/Little Bluestem/Grama	800	0.25
Grama/Sedge	400	0.13

* Based on 790 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25% harvest efficiency (refer to USDA NRCS, National Range and Pasture Handbook).

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage. During the dormant period, the forage for livestock will likely be lacking protein to meet livestock requirements, and added protein will allow ruminants to better utilize the energy stored in grazed plant materials. A forage quality test (either directly or through fecal sampling) should be used to determine the level of supplementation needed.

Hydrology Functions

Water is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic group A. Infiltration varies from rapid to very rapid and runoff varies from low to medium depending on slope and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where short grasses form a dense sod and dominate the site. Normally areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting opportunities for upland game species. The wide varieties of plants, which bloom from spring until fall, have an esthetic value that appeals to visitors.

Wood Products

Other Products

Selected seed harvest of certain unique native plant species can provide additional income.

Supporting Information

Associated Sites

- (060AY009SD) – Sandy
- (060AY024SD) – Shallow Loamy
- (060AY044SD) – Shallow Sandy
- (060AY017SD) – Shallow Clayey

Similar Sites

- (060AY024SD) – Shallow Loamy
[less needleandthread, porcupine grass, western wheatgrass & sideoats grama;
higher production]
(060AY044SD) – Shallow Sandy
[more sandreed/bluestem; less plains muhly/sideoats grama; higher production]

Inventory Data References

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was also used. Those involved in developing this site description include: Stan Boltz, Range Management Specialist, NRCS; Darrel DuVall, Range Management Specialist, NRCS; Jill Epley, Range Management Specialist, NRCS; Cheryl Nielsen, Range Management Specialist, NRCS; Rick Peterson, Range Management Specialist, NRCS; Mike Stirling, Range Management Specialist, NRCS.

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417				

State Correlation

This site has been correlated between Montana, Nebraska, South Dakota & Wyoming in MLRA 60A.

Field Offices

Belle Fourche, SD	Custer, SD	Hot Springs, SD	Pine Ridge, SD	Sundance, WY
Broadus, MT	Ekalaka, MT	Lusk, WY	Rapid City, SD	Wall, SD
Buffalo, SD	Faith, SD	Martin, SD	Rushville, NE	
Chadron, NE	Gillette, WY	Newcastle, WY	Sturgis, SD	

Relationship to Other Established Classifications

Level IV Ecoregions of the Conterminous United States: 43e – Sagebrush Steppe, 43g – Semiarid Pierre Shale Plains, and 43k – Dense Clay Prairie.

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (<http://hpccsun.unl.edu>)
USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (<http://wcc.nrcs.usda.gov>)
USDA, NRCS. National Range and Pasture Handbook, September 1997
USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (<http://nasis.nrcs.usda.gov>)
USDA, NRCS, 2002. National Soil Survey Handbook, title 430-VI. (<http://soils.usda.gov/procedures/handbook/main.htm>)
USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
USDA, NRCS, Various Published Soil Surveys.

Site Description Approval

MT, State Range Management Specialist	Date	NE, State Range Management Specialist	Date
SD, State Range Management Specialist	Date	WY, State Range Management Specialist	Date

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Section II
NRCS-OCTOBER 2003